配置AS5350或AS5400以用于传出调制解调器和ISDN呼叫

目录

简介

这个配置包括带有一个主速率接口(PRI) 的Cisco AS5400，支持23个调制解调器呼叫或ISDN呼叫，这取决于主机拨出或拨入。配置有四个 PRI 以允许异步和 ISDN 出站连接。我们已在每个 ISDN 或异步连接的拨号端上配置了静态拨号程序映射。我们正在连接两端使用静态IP路由，以避免不必要的动态路由协议开销。要添加远端位置，必须在拨号端的为新目的地添加拨号映射、用户名和静态路由。所有的远程节点都有固定的 IP 地址。

注意：本文档不涵盖AS5350或AS5400系列路由器上的传入调制解调器和ISDN呼叫。有关部门这方面的更多信息，请参见为流入异步呼叫和ISDN呼叫配置AS5350/AS5400的章节。

先决条件

要求

在尝试此配置前，请保证您符合这些要求：

- 请确保电信公司提供了用于拨出同步和异步的 ISDN PRI 电路。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 运行 Cisco IOS® 软件版本 12.2(6) 的 AS5400
- 一个有效的 T1 PRI
- 运行端口件 0.6.108.0 的 Nextport 调制解调器

因为此配置只是实现基本的模拟和ISDN拨入，AS5350和AS5400支持的任何Cisco IOS软件版本都足以满足需求。使用其它功能，参见"软件顾问工具"，选择适合您的需求的IOS版本和功能集。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

相关产品

该配置还可应用于 AS5350 或 AS5400 接入服务器。

可以对该配置进行修改以与 E1 PRI 端口一起使用。为E1控制器配置Telco提供的线性编码、成帧及其他物理特性。D信道配置(E1的接口串行x:15)和这里显示的类似。

该配置非常类似于用于拨出访问的 AS5200 或 AS5300 配置。请参阅文档 AS5300 以 ISDN/异步方式拨出（出站 DDR）。 两者之间唯一的主要变化是dial-tdm-clock priority number t1_slot/port 命令，该命令用于在AS5350或AS5400中分配T1时钟优先级。

还可以对该配置进行修改以支持传入和传出呼叫。如需了解更多信息，请参见"在同一条T1/E1 PRI电路上配置拨入和拨出"文档。
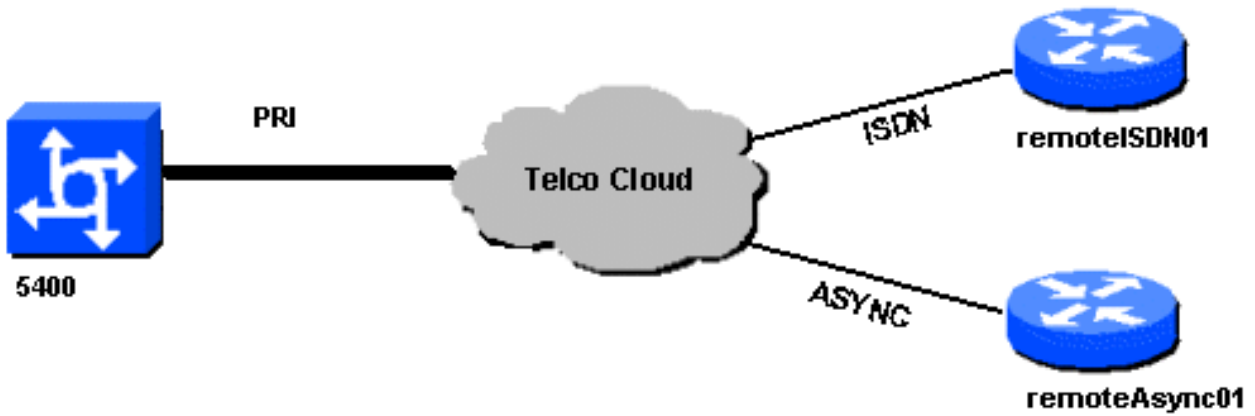
规则

有关文件规则的更多信息请参见" Cisco技术提示规则"。

配置

本部分提供有关如何配置本文档所述功能的信息。

注：要查找有关本文档中使用的命令的其他信息，请使用命令查找工具(仅注册客户)。

网络图

本文档使用以下网络设置：

配置

本文档使用以下配置：

5400

```
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 5400
!
no boot startup-test
!
username remoteISDN01 password open4u
username remoteAsync01 password open4u
!--- Usernames for remote routers and shared secret !---
(used for CHAP authentication). !--- These usernames are
for local authentication of the call. !--- The client
presents the username/password and the NAS !---
authenticates the peer. ! ! resource-pool disable ! ip
subnet-zero ip cef no ip domain-lookup ! isdn switch-
type primary-5ess ! fax interface-type fax-mail mta
receive maximum-recipients 0 ! controller T1 7/0 !--- T1
Physical interface controller configuration. !---
Interfaces are addressed as controller slot/port.
framing esf !--- Framing for this T1 is Extended Super
Frame (ESF). !--- Obtain this information from the
Telco. linecode b8zs !--- Linecoding for this T1. Obtain
this information from the Telco. pri-group timeslots 1-
24 !--- PRI T1 with 24 DSOs provided by the Telco. !---
The PRI signaling is configured in global configuration
or the !--- the serial 7/X:23 interface (d-channel). The
signaling defined !--- under the d-channel takes
precedence over the PRI signaling !--- defined in global
configuration. ! !--- Unsed T1 configuration omitted!
interface FastEthernet0/0 ip address 172.68.186.54
255.255.255.240 duplex auto speed auto ! interface
FastEthernet0/1 no ip address shutdown duplex auto speed
auto ! interface Serial0/0 no ip address shutdown
clockrate 2000000 ! interface Serial0/1 no ip address
```

```
shutdown clockrate 2000000 ! interface Serial7/0:23 no
ip address encapsulation ppp dialer rotary-group 2
```
!--- The D-channel is added to rotary-group 2. Interface Dialer 2 !--- provides the logical configuration for this interface.
```
dialer-group 1 isdn switch-type primary-5ess isdn incoming-voice modem
```
!--- This allows the PRI circuits to accept and place async modem calls.
```
!
interface Group-Async1
```
!--- This group-async interface is the configuration template for all modems. !--- Individual async interface do not have to be configured since they !--- can be cloned from one managed copy.
```
no ip address dialer in-band dialer rotary-group 1
```
!--- This command links this interface to logical interface Dialer interface 1. !--- The Dialer 1 interface serves as template for this interface.
```
group-range 1/00 6/107
```
!--- Modems 1/00 through 6/107 belong to this group-async interface. !--- Make sure you configure line 1/00 through 6/107 as well. !--- This command links all the modem ranges listed to this interface.
```
!
interface Dialer1
```
!--- This interface is used for the modem DDR dialout. !--- This dialer controls rotary-group 1 (configured under Group-Async 1). ! -- Remember that this is a rotary and not a Dialer Profile
```
ip address 10.1.1.1 255.255.255.192 encapsulation ppp dialer in-band
```
!--- Makes this interface DDR capable. !--- If you do not configure a dialer idle-timeout, the default will be 120 !--- seconds.
```
dialer idle-timeout 600
```
!--- Sets Idle timer to 600 seconds (10 minutes).
```
dialer map ip 10.1.1.2 name remoteAsync01 broadcast 4724125
```
!--- Dialer map for the peer. !--- Note the ip address matches the one configure on the peer. !--- The name must also exactly match the one used to authenticate the peer.
```
dialer-group 1
```
!--- Apply interesting traffic definition from dialer-list 1. !--- Note: The specified dialer-group number must be the same as !--- the dialer-list number; in this example, defined as "1". !--- Interesting traffic specifies the packets that should reset the idle timer.
```
ppp authentication chap !
interface Dialer2
```
!--- This interface will be used for the ISDN DDR outbound calls. !--- This dialer controls rotary-group 2 (configured under Serial 7/0:23). ! -- Remember that this is a rotary and not a Dialer Profile
```
ip address 10.1.1.65 255.255.255.192 encapsulation ppp dialer in-band
```
!--- If you do not configure a dialer idle-timeout, the default will be 120 !--- seconds.
```
dialer idle-timeout 600
```
!--- Sets Idle timer to 600 seconds (10 minutes).
```
dialer map ip 10.1.1.66 name remoteISDN01 broadcast 6665800 dialer-group 1
```
!--- Apply interesting traffic definition from dialer-list 1. !--- Note: The specified dialer-group number must be the same as !--- the dialer-list number; in this example, defined to be "1". !--- Interesting traffic specifies the packets that should reset the idle timer.
```
ppp authentication chap ! ip classless ip route 10.1.200.0 255.255.255.0 10.1.1.2
```
!--- Static route for the 10.1.200.0/24 network. !--- Note the next hop IP address is the peer router. !--- This also matches the ip address in the dialer map !--- statement under int Dialer 1.
```
ip route 10.1.201.0 255.255.255.0 10.1.1.66
```
!--- Static route for the 10.1.201.0/24 network. !--- Note the next hop IP address is the peer router. !--- This also matches the ip address in the dialer map !--- statement under interface Dialer 2
```
no ip http server !
dialer-list 1 protocol ip permit
```
!--- Specifies all IP

```
traffic as interesting. Interesting traffic !---
specifies the packets that should reset the idle timer.
!--- This is applied to interface Group-Async 1 using
dialer-group 1. !--- Note: The specified dialer-list
number must be the same as the !--- dialer-group number;
in this example, defined to be "1". ! ! call rsvp-sync !
voice-port 7/0:D ! voice-port 7/1:D ! voice-port 7/2:D !
voice-port 7/3:D ! ! mgcp profile default ! ! line con 0
line aux 0 line vty 0 4 login line 1/00 1/107 !--- These
lines are linked to the modems. Note that this range
includes !--- the group-range configured under group-
async 1. modem InOut !--- Permit incoming and outgoing
calls on the modem. transport input all line 6/00 6/107
!--- These lines are linked to the modems. Note that
this line range is !--- included in the group-range
configured under group-async 1. modem InOut transport
input all ! scheduler allocate 10000 400 end
```

remoteAsync01

```
remoteAsync01
!
version 12.0
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname remoteAsync01
!
enable password <deleted>
!
username 5400 password open4u
 !--- Username and password for the 5400. !--- The
shared secret password must be identical on both sides.
ip subnet-zero no ip domain-lookup ! interface Ethernet0
ip address 10.1.200.1 255.255.255.0 no ip directed-
broadcast ! interface Serial0 no ip address no ip
directed-broadcast shutdown ! interface Serial1 no ip
address no ip directed-broadcast shutdown ! interface
Async1 !--- Async interface for the incoming modem call.
ip address 10.1.1.2 255.255.255.192 !--- IP address for
this interface. !--- Note: this ip address is the same
as the one configured in the !--- dialer map on the 5400
Dialer 1. no ip directed-broadcast encapsulation ppp ppp
authentication chap ! no ip http server ip classless ip
route 0.0.0.0 0.0.0.0 10.1.1.1 !--- Default router with
next hop being the 5400's dialer 1 ip address. ! line
con 0 transport input none line 1 8 !--- Line number
range includes line 1(corresponding to interface
async1). modem InOut transport input all speed 38400
flowcontrol hardware line aux 0 line vty 0 4 ! end
```

remoteISDN01

```
!
version 12.0
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname remoteISDN01
!
enable secret <deleted>
!
username 5400 password open4u
```

```
 !--- Username and password for the 5400 router. !---
The shared secret password must be identical on both
sides. ip subnet-zero no ip domain-lookup ! isdn switch-
type basic-5ess ! interface Ethernet0 ip address
10.1.201.1 255.255.255.0 no ip directed-broadcast !
interface Serial0 no ip address no ip directed-broadcast
shutdown ! interface Serial1 no ip address no ip
directed-broadcast shutdown ! interface BRI0 !--- BRI
interface for incoming call. ip address 10.1.1.66
255.255.255.192 !--- IP address is the same as that
configured on the 5400 Dialer 2 !--- dialer map
statement. !--- A dialer map is not needed on this
router. A dynamic map will be created !--- for incoming
calls. If this router is to be used for outgoing calls
!--- then a dialer map is needed. no ip directed-
broadcast encapsulation ppp dialer-group 1 !---
Interesting traffic definition from dialer-list 1. isdn
switch-type basic-5ess ppp authentication chap ! no ip
http server ip classless ip route 0.0.0.0 0.0.0.0
10.1.1.65 !--- Default route points to ip address of
5400 dialer 2 interface. ! dialer-list 1 protocol ip
permit ! line con 0 transport input none line aux 0 line
vty 0 4 ! end
```

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

命令输出解释程序工具（仅限注册用户）支持某些 show 命令，使用此工具可以查看对 show 命令输出的分析。

- show isdn status - 状态应为：
  ```
  layer 1 = active
  layer 2 = MULTIPLE_FRAMES_ESTABLISHED
  ```

  如果第 1 层无效，接线适配器或端口可能出现故障或未插入。如果第 2 层处于"TEI_ASSIGNED"状态，则路由器未与交换机通信。有关详细信息，请参阅 T1 PRI 故障排除文档。

- show isdn service - 检查 B 信道的状态。每个呼叫都应有一个繁忙状态的信道。
- show caller - 显示特定用户的参数，例如分配的IP地址、点对点协议(PPP)、PPP捆绑参数等。如果您的Cisco IOS版本软件不支持此指令，请使用show users命令。

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

命令输出解释程序工具（仅限注册用户）支持某些 show 命令，使用此工具可以查看对 show 命令输出的分析。

注意：在发出debug命令之前，请参阅有关Debug命令的重要信息。

如下所示，在全局配置中配置时间戳：

```
service timestamps debug datetime msec
service timestamps log datetime msec
```
使用下列命令排除故障：

- debug dialer - 在接口中启用按需拨号路由 (DDR) 时，该命令可以显示有关任何呼叫原因（称为拨号原因）的信息。
- debug isdn q931 — 在发起出站呼叫时检查ISDN连接。
- debug ppp negotiation - **查看客户端是否传递 PPP 协商。**大量的并发 PPP 协商可能会使路由器 CPU 过载。
- debug ppp authentication -**看见客户端可以是否通过认证。**
- debug ppp error - **显示和PPP连接协商与操作相关的协议错误以及统计错误。**

对于调制解调器故障排除，请使用下列命令：

- debug modem - **查看路由器是否从调制解调器接收正确信号。**
- debug modem csm - **启用调制解调器管理呼叫切换模块 (CSM) 的调试模式。**

如需了解nextport命令的更多信息，请参见Cisco AS5400通用网关的管理端口服务章节。

调试输出示例

以下是成功呼叫的一些调试输出。注意在输出和备注中的粗体部分。比较您得到与如下所示的结果的输出。

出站调制解调器呼叫

```
Router#show debug
General OS:
 Modem control/process activation debugging is on
Dial on demand:
  Dial on demand events debugging is on
 CSM Modem:
  Modem Management Call Switching Module debugging is on
PPP:
  PPP authentication debugging is on
  PPP protocol errors debugging is on
  PPP protocol negotiation debugging is on
 ISDN:
 ISDN events debugging is on
 ISDN Q931 packets debugging is on
ISDN events debug DSLs. (On/Off/No DSL:1/0/-)
DSL  0 --> 31
1 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)
DSL  0 --> 31
1 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

Router#ping 10.1.1.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.2, timeout is 2 seconds:
*Jan  2 01:07:19.085: As1/107 DDR: rotor dialout [priority]
*Jan  2 01:07:19.085: As1/107 DDR: Dialing cause ip (s=10.1.1.1, d=10.1.1.2)
*Jan  2 01:07:19.085: As1/107 DDR: Attempting to dial 4724125
```
!--- The DDR process has detected interesting traffic destined for a device off !--- dialer 1's interface and is inticating a call. `*Jan 2 01:07:19.085: CHAT1/107: Attempting async line dialer script *Jan 2 01:07:19.085: CHAT1/107: no matching chat script found for 4724125 *Jan 2`

01:07:19.085: CHAT1/107: Dialing using Modem script: d0efault-d0ials0cript & System script: none
*Jan 2 01:07:19.085: CHAT1/107: process started *Jan . 2 01:07:19.085: CHAT1/107: Asserting DTR
*Jan 2 01:07:19.085: CHAT1/107: Chat script d0efault-d0ials0cript started *Jan 2 01:07:20.533:
CSM DSPLIB(1/107): Rcvd Dial String (4724125) *Jan 2 01:07:20.533: CSM_PROC_IDLE:
CSM_EVENT_MODEM_OFFHOOK at slot 1, port 107 *Jan 2 01:07:20.537: csm_get_signaling_channel
csm_call_info->bchan_num 0xFFFFFFFF *Jan 2 01:07:20.537: csm_get_signaling_channel
dchan_index=16504,next_index=0, dchan_info=0x628C2BF0 *Jan 2 01:07:20.537:
CSM_PROC_OC3_COLLECT_ALL_DIGIT: CSM_EVENT_GET_ALL_DIGITS at **slot 1, port 107**
*Jan 2 01:07:20.537: CSM_PROC_OC3_COLLECT_ALL_DIGIT: called party num: (4724125)
at **slot 1, port 107**
!--- The Call Switch Module (CSM) is informed of the call. !--- The CSM allocates modem 1/107
for the outbound call. *Jan 2 01:07:20.537: csm_get_signaling_channel csm_call_info->bchan_num
0xFFFFFFFF *Jan 2 01:07:20.537: csm_get_signaling_channel dchan_index=24935,next_index=0,
dchan_info=0x628C2BF0 *Jan 2 01:07:20.537: ISDN Se7/0:23: Outgoing call id = 0x800F, dsl 0 *Jan
2 01:07:20.537: CSM_PROC_OC3_COLLECT_ALL_DIGIT: csm_call_info->bchan_num 0xFFFFFFFF *Jan 2
01:07:20.537: ISDN Se7/0:23: VOICE_I.SDNCALL Event: call id 0x800F, bchan 65535, ces 0 *Jan 2
01:07:20.537: ISDN Se7/0:23: process_pri_call(): call id 0x800F, number 4724125, speed 64, call
type VOICE, redialed? f, csm call? t, pdata? f *Jan 2 01:07:20.537: trying to get callinf from
isdn_info *Jan 2 01:07:20.537: Don't know what calling number for later redial. *Jan 2
01:07:20.537: ISDN: Created entry call_id 0x800F, speed 64, remote 4724125, calling *Jan 2
01:07:20.537: callED type/plan overridden by call_decode *Jan 2 01:07:20.537: did't copy oct3a
reason: not CALLER_NUMBER_IE *Jan 2 01:07:20.537: building outgoing channel id for call nfas_int
is 0 len is 0 *Jan 2 01:07:20.537: ISDN Se7/0:23: **TX -> SETUP** pd = 8 callref = 0x000C
*Jan 2 01:07:20.537:   Bearer Capability i = 0x8090A2
*Jan 2 01:07:20.537:   Channel ID i = 0xA98397
*Jan 2 01:07:20.537:   Called Party Number i = 0xA1, '4724125', Plan:ISDN,
Type:National
!--- Outgoing Q.931 SETUP message. Indicates an outgoing call. !--- For more information on
Q.931 refer to the document: !--- Troubleshooting ISDN Layer 3 using the debug isdn q931
Command. *Jan 2 01:07:20.617: ISDN Se7/0:23: **RX <- CALL_PROC** pd = 8 callref = 0x800C
*Jan 2 01:07:20.617:   Channel. ID i = 0xA98397
!--- The Call Proceeding Message is sent through the D-channel. *Jan 2 01:07:20.617: ISDN
Se7/0:23: LIF_EVENT: ces/callid 1/0x800F CALL_PROCEEDING *Jan 2 01:07:20.617: ISDN Se7/0:23:
CALL_PROCEEDING id 0x800F *Jan 2 01:07:20.617: ISDN Se7/0:23: PRI Event: 6, bchan = 22, call
type = VOICE *Jan 2 01:07:20.617: EVENT_FROM_ISDN: dchan_idb=0x62C31CC0, call_id=0x800F, ces=0x1
bchan=0x16, event=0x3, cause=0x0 *Jan 2 01:07:20.617: EVENT_FROM_ISDN:(800F): DEV_CALL_PROC at
slot 1 and port 107, bchan 22 on Serial7/0:23 *Jan 2 01:07:20.617: CSM_PROC_OC4_DIALING:
CSM_EVENT_ISDN_BCHAN_ASSIGNED at slot 1, port 107 *Jan 2 01:07:20.617: csm_connect_pri_vdev: TS
allocated at bp_stream 0, bp_Ch 9, vdev_common 0x624BAD88 1/107 *Jan 2 01:07:20.617: CSM
DSPLIB(1/107): np_dsplib_prepare_modem *Jan 2 01:07:20.625: CSM DSPLIB(1/107):DSPLIB_MODEM_INIT:
Modem session transition to IDLE *Jan 2 01:07:20.717: ISDN Se7/0:23: RX <- ALERTING pd = 8
callref = 0x800C *Jan 2 01:07:20.717: ISDN Se7/0:23: LIF_EVENT: ces/callid 1/0x800F
CALL_PROGRESS *Jan 2 01:07:20.717: ISDN Se7/0:23: event CA.LL_PROGRESS dsl 0 *Jan 2
01:07:20.797: ISDN Se7/0:23: **RX <- CONNECT** pd = 8 callref = 0x800C
!--- Received the Q.931 CONNECT. *Jan 2 01:07:20.797: ISDN Se7/0:23: LIF_EVENT: ces/callid
1/0x800F CALL_CONNECT *Jan 2 01:07:20.797: ISDN Se7/0:23: Event CALL_CONNECT dsl 0 *Jan 2
01:07:20.797: EVENT_FROM_ISDN: dchan_idb=0x62C31CC0, call_id=0x800F, ces=0x1 bchan=0x16,
event=0x4, cause=0x0 *Jan 2 01:07:20.797: EVENT_FROM_ISDN:(800F): DEV_CONNECTED at slot 1 and
port 107 *Jan 2 01:07:20.797: CSM_PROC_OC5_WAIT_FOR_CARRIER: CSM_EVENT_ISDN_CONNECTED at slot 1,
port 107 *Jan 2 01:07:20.797: CSM DSPLIB(1/107): np_dsplib_call_accept *Jan 2 01:07:20.797: ISDN
Se7/0:23: LIF_EVENT: ces/callid 1/0x800F CALL_PROGRESS *Jan 2 01:07:20.797: ISDN Se7/0:23: event
CALL_PROGRESS dsl 0 *Jan 2 01:07:20.797: ISDN Se7/0:23: **TX -> CONNECT_ACK** pd = 8 callref =
0x000C
!--- D-channel transmits a CONNECT_ACK. *Jan 2 01:07:20.801: CSM
DSPLIB(1/107):DSPLIB_MODEM_WAIT_ACTIVE: Modem session transition to ACTIVE *Jan 2 01:07:20.801:
CSM DSPLIB(1/107): Modem state changed to (CONNECT_STATE) *Jan 2 01:07:26.797: %ISDN-6-CONNECT:
Interface Serial7/0:22 is now connected to 4724125 *Jan 2 01:07:26.893: CSM DSPLIB(1/107): Modem
state changed to (LINK_STATE) *Jan 2 01:07:29.837: CSM DSPLIB(1/107): Modem state changed to
(TRAINUP_STATE) *Jan 2 01:07:37.997: CSM DSPLIB(1/107): Modem state changed to
(EC_NEGOTIATING_STATE) *Jan 2 01:07:38.333: CSM DSPLIB(1/107): Modem state changed to
(STEADY_STATE) *!--- Modems have trained up and are in a steady state.* *Jan 2 01:07:38.333:
CHAT1/107: Chat script d0efault-d0ials0cript finished, status = Success *Jan 2 01:07:38.333:
TTY1/107: no timer type 1 to destroy *Jan 2 01:07:38.333: TTY1/107: no timer type 0 to destroy
*Jan 2 01:07:38.333: Di1 IPCP: Install route to 10.1.1.2 *Jan 2 01:07:40.333: %LINK-3-UPDOWN:

Interface Async1/107, changed state to up *Jan 2 01:07:40.333: As1/107 DDR: Dialer statechange to up *Jan 2 01:07:40.333: As1/107 DDR: Dialer call has been placed *Jan 2 01:07:40.333: As1/107 PPP: Treating connection as a callout *Jan 2 01:07:40.333: As1/107 PPP: **Phase is ESTABLISHING, Active Open**

[0 sess, 1 load]

!--- LCP negotiation begins. *Jan 2 01:07:42.469: As1/107 LCP: I CONFREQ [REQsent] id 1 len 25 *Jan 2 01:07:42.469: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:42.469: As1/107 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 01:07:42.469: As1/107 LCP: MagicNumber 0x2862C096 (0x05062862C096) *Jan 2 01:07:42.469: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:42.469: As1/107 LCP: ACFC (0x0802) *!--- Incoming LCP CONFREQ. !--- For more information on interpreting PPP debugs refer to the document: !--- Dialup Technology: Troubleshooting Techniques* *Jan 2 01:07:42.469: As1/107 LCP: O CONFACK [REQsent] id 1 len 25 *Jan 2 01:07:42.469: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:42.469: As1/107 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 01:07:42.469: As1/107 LCP: MagicNumber 0x2862C096 (0x05062862C096) *Jan 2 01:07:42.469: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:42.469: As1/107 LCP: ACFC (0x0802) *Jan 2 01:07:44.333: As1/107 LCP: O CONFREQ [ACKsent] id 29 len 25 *Jan 2 01:07:44.333: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:44.333: As1/107 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 01:07:44.333: As1/107 LCP: MagicNumber 0x081D8CEC (0x0506081D8CEC) *Jan 2 01:07:44.333: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:44.333: As1/107 LCP: ACFC (0x0802) *Jan 2 01:07:44.461: As1/107 LCP: I CONFACK [ACKsent] id 29 len 25 *Jan 2 01:07:44.461: As1/107 LCP: ACCM 0x000A0000 (0x0206000A0000) *Jan 2 01:07:44.461: As1/107 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 01:07:44.461: As1/107 LCP: MagicNumber 0x081D8CEC (0x0506081D8CEC) *Jan 2 01:07:44.461: As1/107 LCP: PFC (0x0702) *Jan 2 01:07:44.461: As1/107 LCP: ACFC (0x0802) *Jan 2 01:07:44.461: As1/107 LCP: **State is Open**

! --- LCP negotiation is complete. *Jan 2 01:07:44.461: As1/107 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load] *Jan 2 01:07:44.461: As1/107 CHAP: O CHALLENGE id 16 len 27 from "Router" *Jan 2 01:07:44.477: As1/107 CHAP: I CHALLENGE id 1 len 34 from "remoteAsync01" *Jan 2 01:07:44.477: As1/107 CHAP: O RESPONSE id 1 len 27 from "Router" *Jan 2 01:07:44.581: As1/107 CHAP: I RESPONSE id 16 len 34 from "remoteAsync01" *Jan 2 01:07:44.581: As1/107 CHAP: **O SUCCESS** id 16 len 4

*Jan 2 01:07:44.601: As1/107 CHAP: **I SUCCESS** id 1 len 4

!--- CHAP authentication is successful. !--- If this fails, verify that the username and password are correct. !--- Refer to Dialup Technology: Troubleshooting Techniques. *Jan 2 01:07:44.601: As1/107 PPP: Phase is UP [0 sess, 1 load] *Jan 2 01:07:44.601: As1/107 IPCP: O CONFREQ [Closed] id 6 len 10 *Jan 2 01:07:44.601: As1/107 IPCP: Address 10.1.1.1 (0x03060A010101) *Jan 2 01:07:44.601: As1/107 CDPCP: O CONFREQ [Closed] id 5 len 4 *Jan 2 01:07:44.701: As1/107 IPCP: I CONFREQ [REQsent] id 1 len 10 *Jan 2 01:07:44.701: As1/107 IPCP: Address 10.1.1.2 (0x03060A010102) *Jan 2 01:07:44.701: As1/107 IPCP: O CONFACK [REQsent] id 1 len 10 *Jan 2 01:07:44.701: As1/107 IPCP: Address 10.1.1.2 (0x03060A010102) *Jan 2 01:07:44.705: As1/107 CDPCP: I CONFREQ [REQsent] id 1 len 4 *Jan 2 01:07:44.705: As1/107 CDPCP: O CONFACK [REQsent] id 1 len 4 *Jan 2 01:07:44.733: As1/107 IPCP: I CONFACK [ACKsent] id 6 len 10 *Jan 2 01:07:44.733: As1/107 IPCP: Address 10.1.1.1 (0x03060A010101) *Jan 2 01:07:44.733: As1/107 **IPCP: State is Open**

*Jan 2 01:07:44.733: As1/107 DDR: dialer protocol up

!--- The route has been successfully negotiated and installed in the routing table. *Jan 2 01:07:44.737: As1/107 CDPCP: I CONFACK [ACKsent] id 5 len 4 *Jan 2 01:07:44.737: As1/107 CDPCP: State is Open *Jan 2 01:07:45.601: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async1/107, changed state to up *Jan 2 01:07:48.321: TTY0: timer type 1 expired *Jan 2 01:07:48.321: TTY0: Exec timer (continued)

出站 ISDN 呼叫

以下是成功的 ISDN 出站呼叫的一些调试输出。注意在输出和备注中的粗体部分。比较您得到与如下所示的结果的输出。

```
Router#show debug
Dial on demand:
  Dial on demand events debugging is on
PPP:
  PPP authentication debugging is on
  PPP protocol errors debugging is on
  PPP protocol negotiation debugging is on
```

```
ISDN:
  ISDN events debugging is on
  ISDN Q931 packets debugging is on
  ISDN events debug DSLs. (On/Off/No DSL:1/0/-)
  DSL  0 --> 31
  1 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  ISDN Q931 packets de  ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)
  DSL  0 --> 31
  1 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -


Router#ping 10.1.1.66
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.1.66, timeout is 2 seconds:
*Jan  2 02:00:59.937: Se7/0:23 DDR: rotor dialout [priority]
*Jan  2 02:00:59.937: Se7/0:23 DDR: Dialing cause ip (s=10.1.1.65, d=10.1.1.66)
*Jan  2 02:00:59.937: Se7/0:23 DDR: Attempting to dial 6665800
```
!--- The DDR process has detected interesting traffic destined for a device off !--- dialer 1's interface and is inticating a call. *Jan 2 02:00:59.937: ISDN Se7/0:23: Outgoing call id = 0x8016, dsl 0 *Jan 2 02:00:59.937: ISDN Se7/0:23: Event: Call to 4724125 at 64 Kb/s *Jan 2 02:00:59.937: ISDN Se7/0:23: process_pri_call(): call id 0x8016, number 6665800, speed 64, call type DATA, redialed? f, csm call? f, pdata? f *Jan 2 02:00:59.937: callED type/plan overridden by call_decode *Jan 2 02:00:59.937: did't copy oct3a reason: not CALLER_NUMBER_IE *Jan 2 02:00:59.941: building outgoing channel id for call nfas_int is 0 len is 0 *Jan 2 02:00:59.941: ISDN Se7/0:23: **TX -> SETUP** pd = 8 callref = 0x0013

```
*Jan  2 02:00:59.941:        Bearer Capability i = 0x8890
*Jan  2 02:00:59.941:        Channel ID i = 0xA98397
*Jan  2 02:00:59.941:        Called Pa.rty Number i = 0xA1, '6665800',
Plan:ISDN, Type:National
```

!--- Outgoing Q.931 SETUP message. Indicates an outgoing call. !--- For more information on Q.931 refer to the document. !--- Troubleshooting ISDN Layer 3 using the debug isdn q931 Command. *Jan 2 02:01:00.017: ISDN Se7/0:23: RX <- CALL_PROC pd = 8 callref = 0x8013 *Jan 2 02:01:00.017: Channel ID i = 0xA98397 *!--- The Call Proceeding Message is sent through the D-channel.* *Jan 2 02:01:00.017: ISDN Se7/0:23: LIF_EVENT: ces/callid 1/0x8016 CALL_PROCEEDING *Jan 2 02:01:00.017: ISDN Se7/0:23: CALL_PROCEEDING id 0x8016 *Jan 2 02:01:00.021: ISDN Se7/0:23: PRI Event: 6, bchan = 22, call type = DATA *Jan 2 02:01:00.093: ISDN Se7/0:23: **RX <- CONNECT** pd = 8 callref = 0x8013

!--- Received the Q.931 CONNECT. *Jan 2 02:01:00.097: ISDN Se7/0:23: LIF_EVENT: ces/callid 1/0x8016 CALL_CONNECT *Jan 2 02:01:00.097: ISDN Se7/0:23: Event CALL_CONNECT dsl 0 *Jan 2 02:01:00.097: %LINK-3-UPDOWN: Interface Serial7/0:22, changed state to up *Jan 2 02:01:00.097: Se7/0:22 PPP: Treating connection as a callout *Jan 2 02:01:00.097: Se7/0:22 PPP: **Phase is ESTABLISHING, Active Open** [0 sess, 1 load]

!--- LCP negotiation begins. *Jan 2 02:01:00.097: Se7/0:22 LCP: **O CONFREQ** [Closed] id 7 len 15 *Jan 2 02:01:00.097: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 02:01:00.097: Se7/0:22 LCP: MagicNumber 0x084E600A (0x0506084E600A)

!--- Outgoing LCP CONFREQ. !--- For more information on interpreting PPP debugs refer to the document !--- Dialup Technology: Troubleshooting Techniques. *Jan 2 02:01:00.097: ISDN Se7/0:23: LIF_EVENT: ces/callid 1/0x8016 CALL_PROGRESS *Jan 2 02:01:00.097: ISDN Se7/0:23: event CALL_PROGRESS dsl 0 *Jan 2 02:01:00.097: ISDN Se7/0:23: **TX -> CONNECT_ACK** pd = 8 callref = 0x0013

!--- D-channel transmits a CONNECT_ACK. *Jan 2 02:01:00.105: Se7/0:22 LCP: I CONFREQ [REQsent] id 30 len 15 *Jan 2 02:01:00.105: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 02:01:00.105: Se7/0:22 LCP: MagicNumber 0x28938B8C (0x050628938B8C) *Jan 2 02:01:00.105: Se7/0:22 LCP: O CONFACK [REQsent] id 30 len 15 *Jan 2 02:01:00.105: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 02:01:00.109: Se7/0:22 LCP: MagicNumber 0x28938B8C (0x050628938B8C) *Jan 2 02:01:00.109: Se7/0:22 LCP: I CONFACK [ACKsent] id 7 len 15 *Jan 2 02:01:00.109: Se7/0:22 LCP: AuthProto CHAP (0x0305C22305) *Jan 2 02:01:00.109: Se7/0:22 LCP: MagicNumber 0x084E600A (0x0506084E600A) *Jan 2 02:01:00.109: Se7/0:22 **LCP: State is Open**

! --- LCP negotiation is complete. *Jan 2 02:01:00.109: Se7/0:22 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load] *Jan 2 02:01:00.109: Se7/0:22 CHAP: O CHALLENGE id 7 len 27 from "Router" *Jan 2 02:01:00.121: Se7/0:22 CHAP: I CHALLENGE id 25 len 33 from "remoteISDN01" *Jan 2 02:01:00.121: Se7/0:22 CHAP: O RESPONSE id 25 len 27 from "Router" *Jan 2 02:01:00.129: Se7/0:22 CHAP: I SUCCESS id 25 len 4 *Jan 2 02:01:00.137: Se7/0:22 CHAP: I RESPONSE id 7 len 33 from "remoteISDN01" *Jan 2 02:01:00.137: Se7/0:22 CHAP: O SUCCESS id 7 len 4 *!--- CHAP authentication is successful. !--- If this fails verify that the username and password are correct. !--- Refer*

to *Dialup Technology: Troubleshooting Techniques*. *Jan 2 02:01:00.137: Se7/0:22 PPP: Phase is UP [0 sess, 1 load] *Jan 2 02:01:00.137: Se7/0:22 IPCP: O CONFREQ [Closed] id 2 len 10 *Jan 2 02:01:00.137: Se7/0:22 IPCP: Address 10.1.1.65 (0x03060A010141) *Jan 2 02:01:00.145: Se7/0:22 IPCP: I CONFREQ [REQsent] id 3 len 10 *Jan 2 02:01:00.145: Se7/0:22 IPCP: Address 10.1.1.66 (0x03060A010142) *Jan 2 02:01:00.145: Se7/0:22 IPCP: O CONFACK [REQsent] id 3 len 10 *Jan 2 02:01:00.145: Se7/0:22 IPCP: Address 10.1.1.66 (0x03060A010142) *Jan 2 02:01:00.145: Se7/0:22 IPCP: I CONFACK [ACKsent] id 2 len 10 *Jan 2 02:01:00.145: Se7/0:22 IPCP: Address 10.1.1.65 (0x03060A010141) *Jan 2 02:01:00.145: Se7/0:22 IPCP: State is Open *Jan 2 02:01:00.145: Se7/0:22 DDR: dialer protocol up *Jan 2 02:01:00.145: Di2 IPCP: **Install route to 10.1.1.66**
!--- The Route has been successfully negotiated and installed in the routing table. *Jan 2 02:01:01.137: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial7/0:22, changed state to up *Jan 2 02:01:06.097: %ISDN-6-CONNECT: Interface Serial7/0:22 is now connected to 6665800 remoteISDN01

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